

correctness of whose views is established by so many important discoveries.

*On the Attractions of an extensive Class of Spheroids.* By James Ivory, A.M. Communicated by Henry Brougham, Esq. F.R.S. Read November 14, 1811. [*Phil. Trans.* 1812, p. 46.]

In his second paper, Mr. Ivory investigates the attractions of that particular class of spheroids mentioned in the former; for though it is to these that the theorems of Laplace may strictly be applied, it is liable to the important objection, that the terms of his series near the beginning cannot be found without previously computing all the rest. The analysis of Mr. Ivory, on the contrary, is direct; and every term of his series is deduced directly from the radius of the spheroid.

In an appendix to these papers, Mr. Ivory adds some remarks upon a memoir of Lagrange, upon the same subject, published at Paris in December 1809, but which had not till lately been received in this country.

*An Account of some Peculiarities in the Structure of the Organ of Hearing in the Balæna Mysticetus of Linnæus.* By Everard Home, Esq. F.R.S. Read December 12, 1811. [*Phil. Trans.* 1812, p. 83.]

From the time that Mr. Home discovered the muscular structure of the membrana tympani in the elephant, he has been seeking an opportunity of prosecuting the same inquiry on a similar scale, by examining the ear of a whale, and has at length succeeded in procuring the head of a young whale preserved in brine. As the skin had been taken off, a portion of the meatus externus had been removed along with it; but it did not appear that much was lost, as the outward extremity partook of the dark colour of the outer skin of the head. This passage was  $5\frac{1}{2}$  inches in length, and only one fourth of an inch in diameter; but near the tympanum it widened to about  $1\frac{1}{4}$  inch, and this is the breadth of the membrana tympani itself.

This membrane, instead of being concave externally as usual, is convex, so as to project nearly an inch into the meatus externus. The membrane consists of four parts: first, a cuticular covering, next a strong membrane, then a layer of muscular fibres; and lastly, another membranous lining towards the tympanum. It is remarkable that this membrane has no connexion whatever with the handle of the malleus, as in other animals.

The cavity of the tympanum is of an oval shape, capable of containing a pint of fluid, surrounded by the concave surface of a large bone peculiar to the whale, detached from the skull, and having only a loose connexion with the petrose portion of the temporal bone. This cavity terminates, as usual, in the eustachian tube, which is  $2\frac{1}{2}$  inches long, terminating by a small aperture, having a valvular structure, and opening into the canal leading to the blow-hole.

Within the cavity of the tympanum is a part peculiar to the whale. This is a membranous fold, or broad ligament, stretched across the cavity, having the form of a triangle, or rather the sector of a circle, the apex of which is attached to the short handle of the malleus, having one side detached, and passing across the centre of the membrana tympani, and its base attached to the concave surface of the hollow bone, at a small distance from the bony rim to which that membrane is connected.

The long handle of the malleus has no connexion with any other part; but the forms of this bone, of the incus, and stapes are much the same as in the human ear; there being no considerable difference excepting in the want of the os orbiculare.

The vestibulum, semicircular canals, cochlea, &c., differ in nothing material from the usual construction of these parts.

From this structure it appears to the author that the membrana tympani, which is subject in the whale to vast differences of pressure from without, is not well fitted, under all circumstances, to convey the nicer vibrations of sound to the ossicula auditûs, but that the membrane which projects across the cavity, being exposed to the same medium on both sides, will freely continue, and communicate the impressions it receives, unaffected by any differences of pressure.

*Chemical Researches on the Blood, and some other Animal Fluids. By William Thomas Brande, Esq. F.R.S. Communicated to the Society for the Improvement of Animal Chemistry, and by them to the Royal Society. Read November 21, 1811. [Phil. Trans. 1812, p. 90.]*

The author, after referring to those authorities by which he had been misled into the supposition that the colour of the blood depended on the presence of iron, until he had tried how slight effect it produced by infusion of galls, proceeds to a series of experiments which he has made upon chyle and on lymph, for the purpose of comparing their composition with that of blood, the examination of which is divided into three sections, in which he treats separately of the serum, the coagulum, and the colouring matter.

The chyle employed in these analyses was collected by Mr. Brande while assisting Mr. Home and Mr. Brodie in their experiments on different animals; attention being always paid to the interval that had elapsed since the last meal; upon which circumstance its qualities were found to depend more than upon the animal from which it was taken. About four hours after a meal, the chyle is supposed to be in its most perfect state, and is then uniformly white, like milk. At longer periods it becomes more dilute, like milk and water, till at length, when an animal has fasted twenty-four hours, the fluid contained in the thoracic duct is reduced to the state of mere lymph.

The taste of chyle is rather salt, with a degree of sweetness, and, by the test of violets, appears very slightly alkaline. In about ten minutes after removal from the thoracic duct, it coagulates, and ulti-